#3

ARCHITECTURE

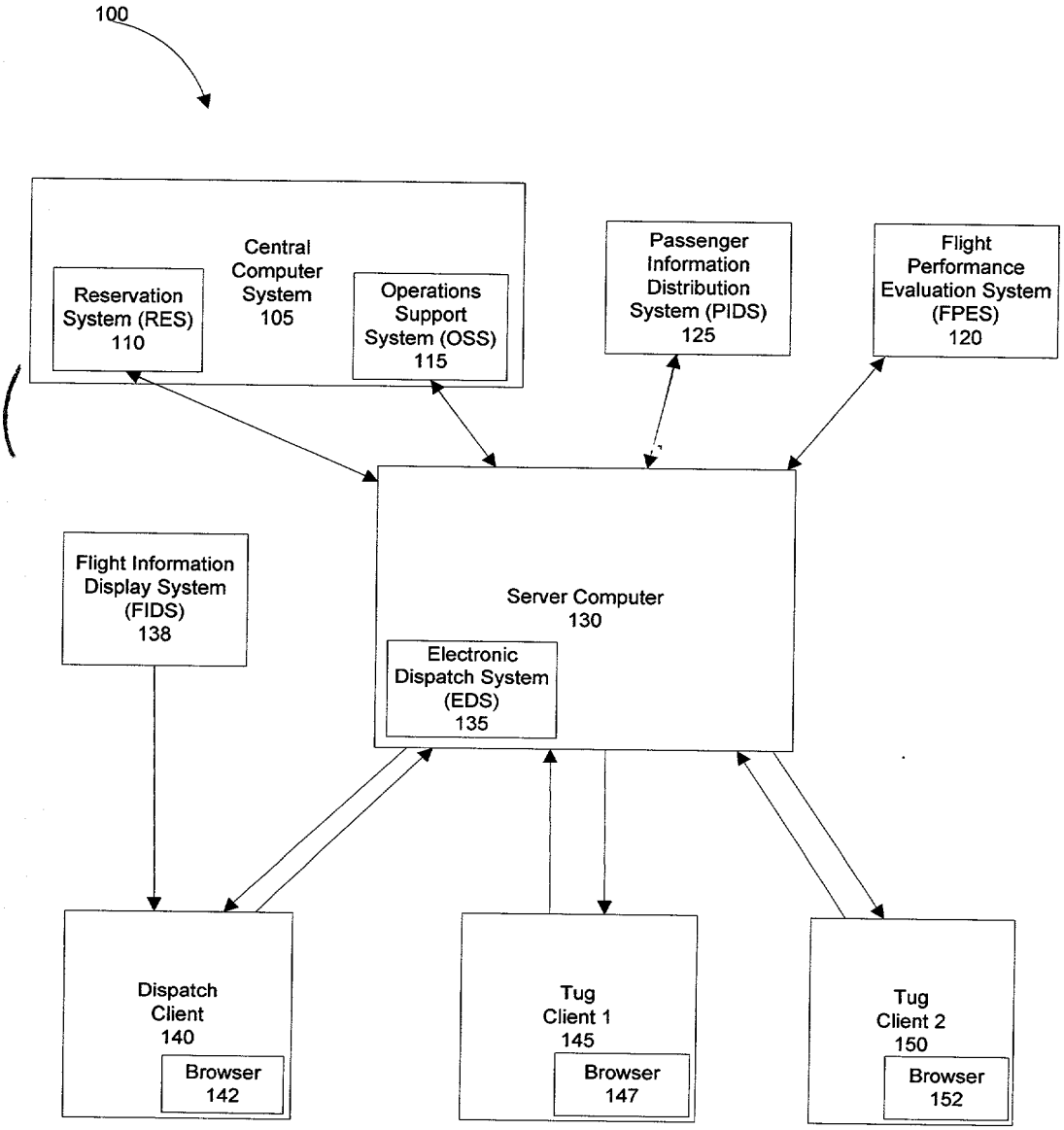

FIG. 1

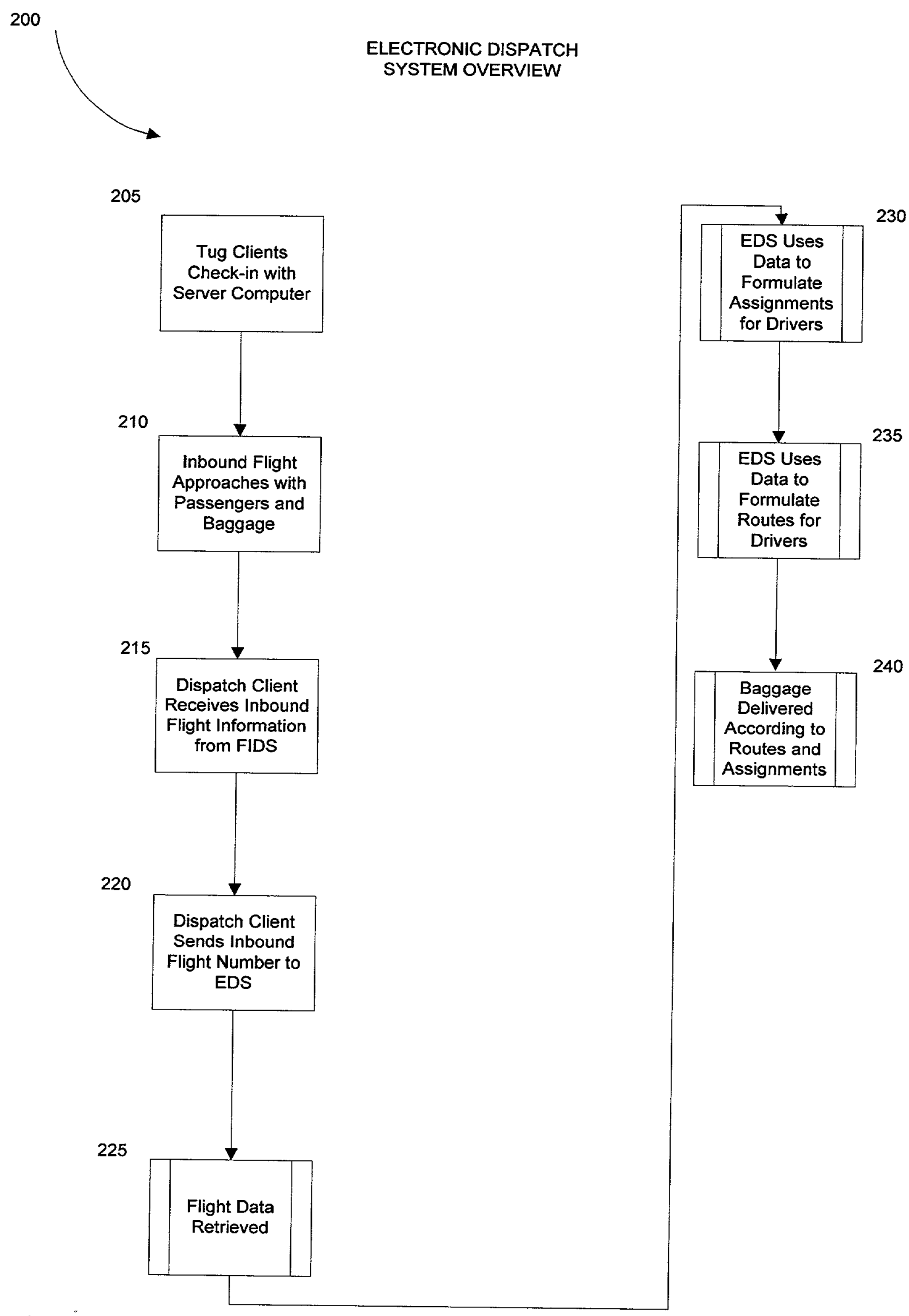
200
ELECTRONIC DISPATCH SYSTEM OVERVIEW
205
Tug Clients Check-in with Server Computer
210
Inbound Flight Approaches with Passengers and Baggage
215
Dispatch Client Receives Inbound Flight Information from FIDS
220
Dispatch Client Sends Inbound Flight Number to EDS
225
Flight Data Retrieved
230
EDS Uses Data to Formulate Assignments for Drivers
235
EDS Uses Data to Formulate Routes for Drivers
240
Baggage Delivered According to Routes and Assignments

FIG. 2

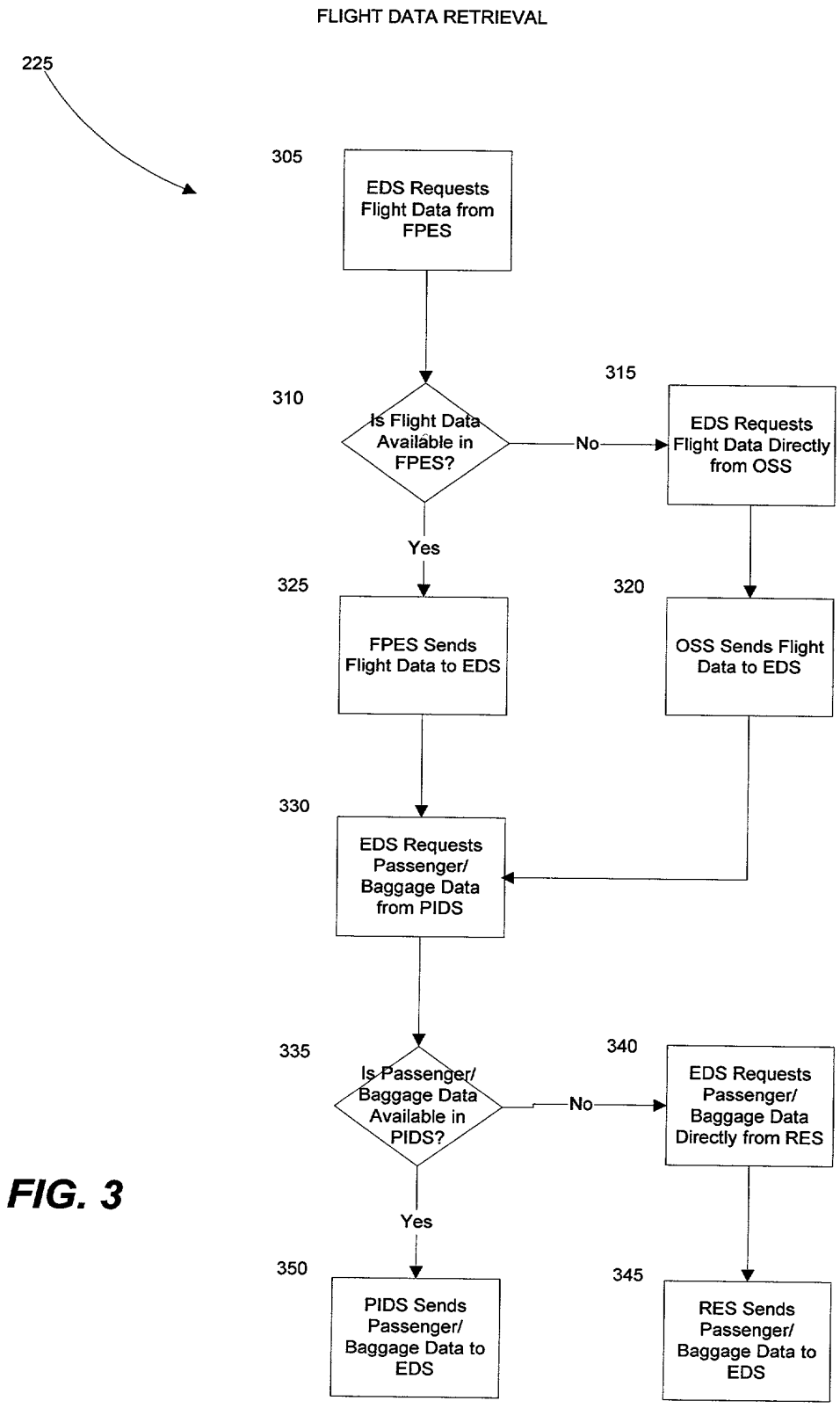
FLIGHT DATA RETRIEVAL
225
305
EDS Requests Flight Data from FPES
310
Is Flight Data Available in FPES?
No
315
EDS Requests Flight Data Directly from OSS
Yes
325
FPES Sends Flight Data to EDS
320
OSS Sends Flight Data to EDS
330
EDS Requests Passenger/ Baggage Data from PIDS
335
Is Passenger/ Baggage Data Available in PIDS?
No
340
EDS Requests Passenger/ Baggage Data Directly from RES
Yes
350
PIDS Sends Passenger/ Baggage Data to EDS
345
RES Sends Passenger/ Baggage Data to EDS

FIG. 3

BAGGAGE DELIVERY
ZONES

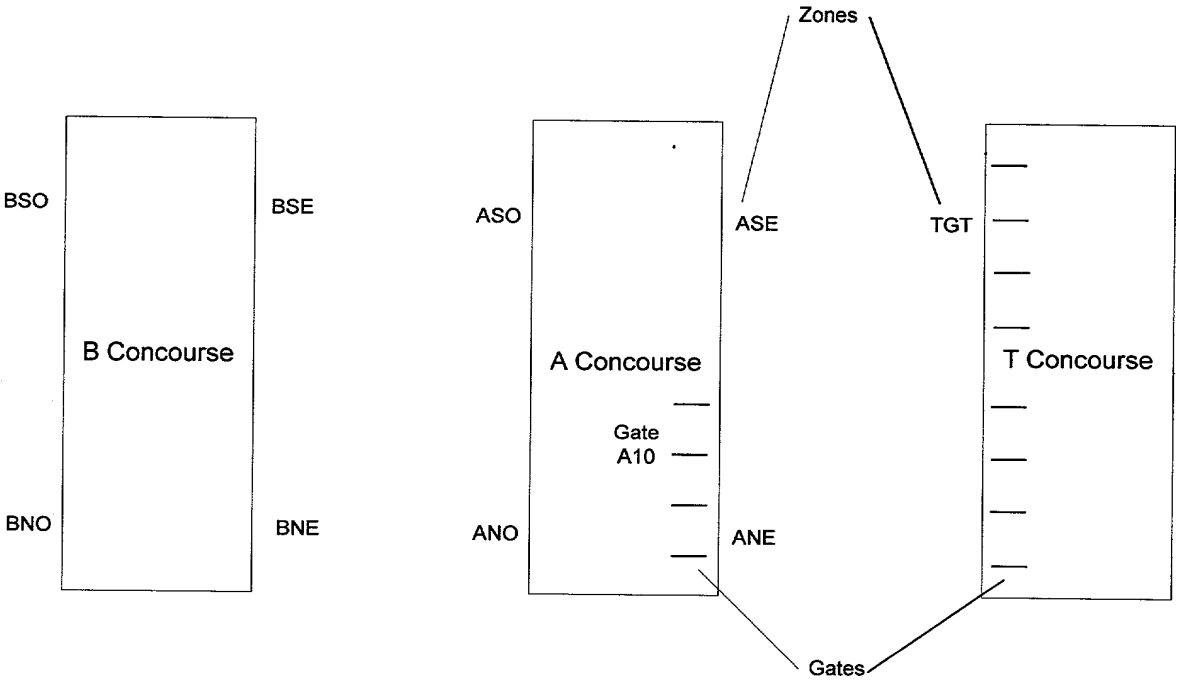

FIG. 4

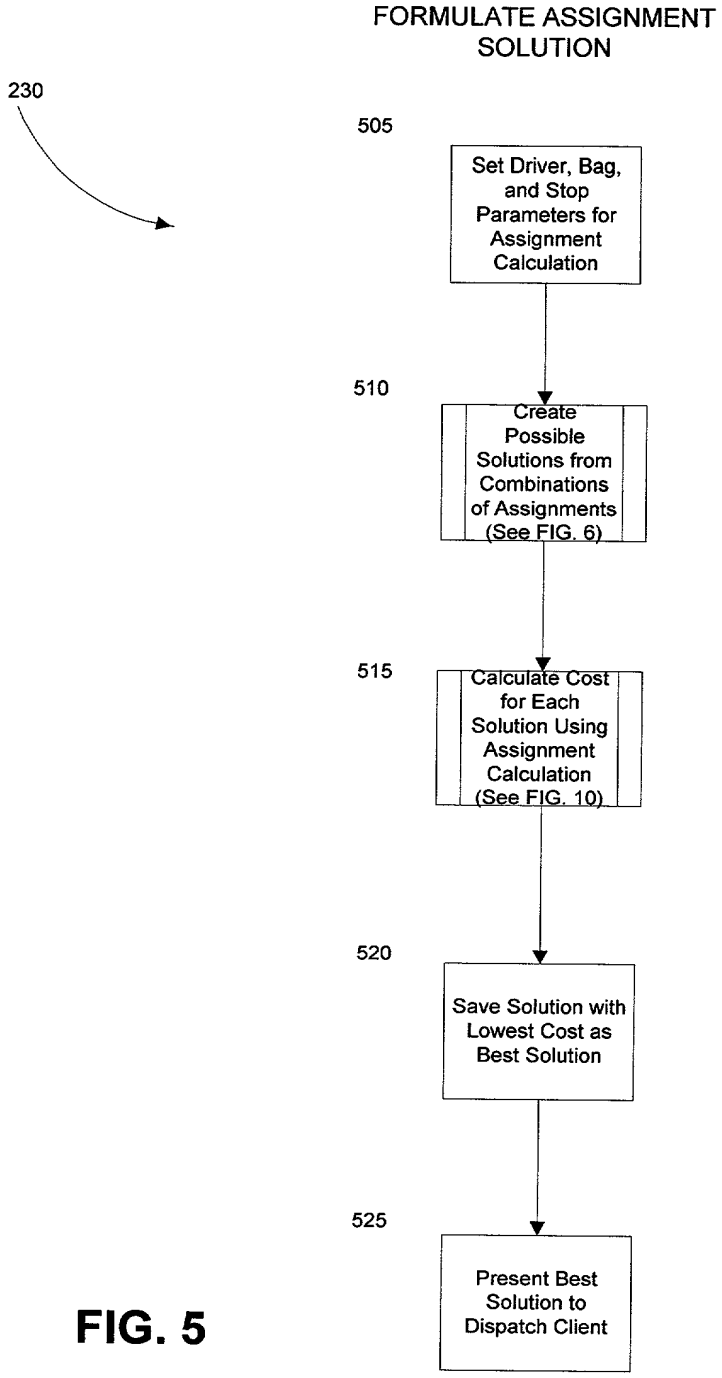
FORMULATE ASSIGNMENT SOLUTION
230
505
Set Driver, Bag, and Stop Parameters for Assignment Calculation
510
Create Possible Solutions from Combinations of Assignments (See FIG. 6)
515
Calculate Cost for Each Solution Using Assignment Calculation (See FIG. 10)
520
Save Solution with Lowest Cost as Best Solution
525
Present Best Solution to Dispatch Client

FIG. 5

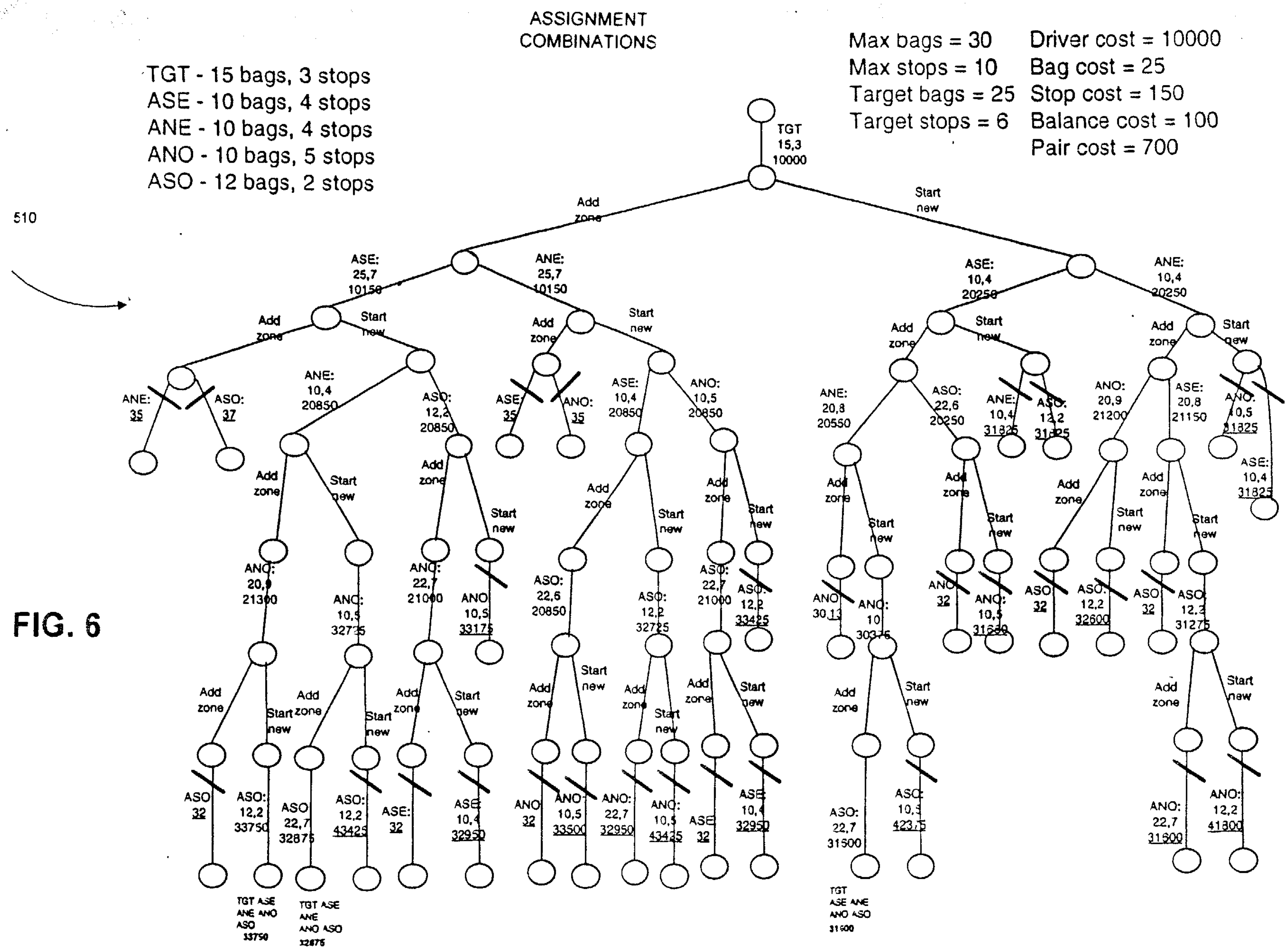
ASSIGNMENT
COMBINATIONS
TGT - 15 bags, 3 stops
ASE - 10 bags, 4 stops
ANE - 10 bags, 4 stops
ANO - 10 bags, 5 stops
ASO - 12 bags, 2 stops
Max bags = 30
Max stops = 10
Target bags = 25
Target stops = 6
Driver cost = 10000
Bag cost = 25
Stop cost = 150
Balance cost = 100
Pair cost = 700
510

FIG. 6

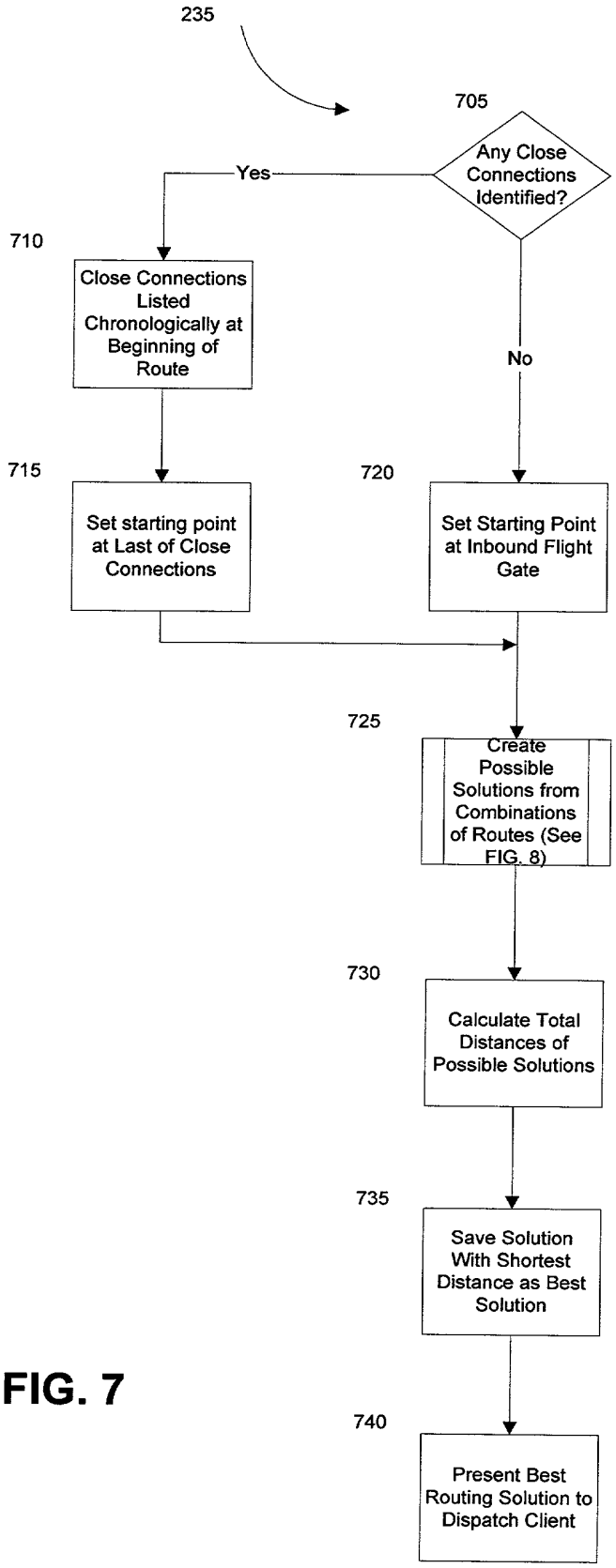
235
FORMULATE ROUTING SOLUTION
705
Any Close Connections Identified?
Yes
No
710
Close Connections Listed Chronologically at Beginning of Route
715
Set starting point at Last of Close Connections
720
Set Starting Point at Inbound Flight Gate
725
Create Possible Solutions from Combinations of Routes (See FIG. 8)
730
Calculate Total Distances of Possible Solutions
735
Save Solution With Shortest Distance as Best Solution
740
Present Best Routing Solution to Dispatch Client

FIG. 7

725

ROUTING COMBINATIONS

GATE	X,Y
A10	40,100000
A26	1030,100000
A2	0,100000
A6	20,100000
T4	30,0
T6	50,0
T5	40,0
A31	1060,110000
A3	10,110000

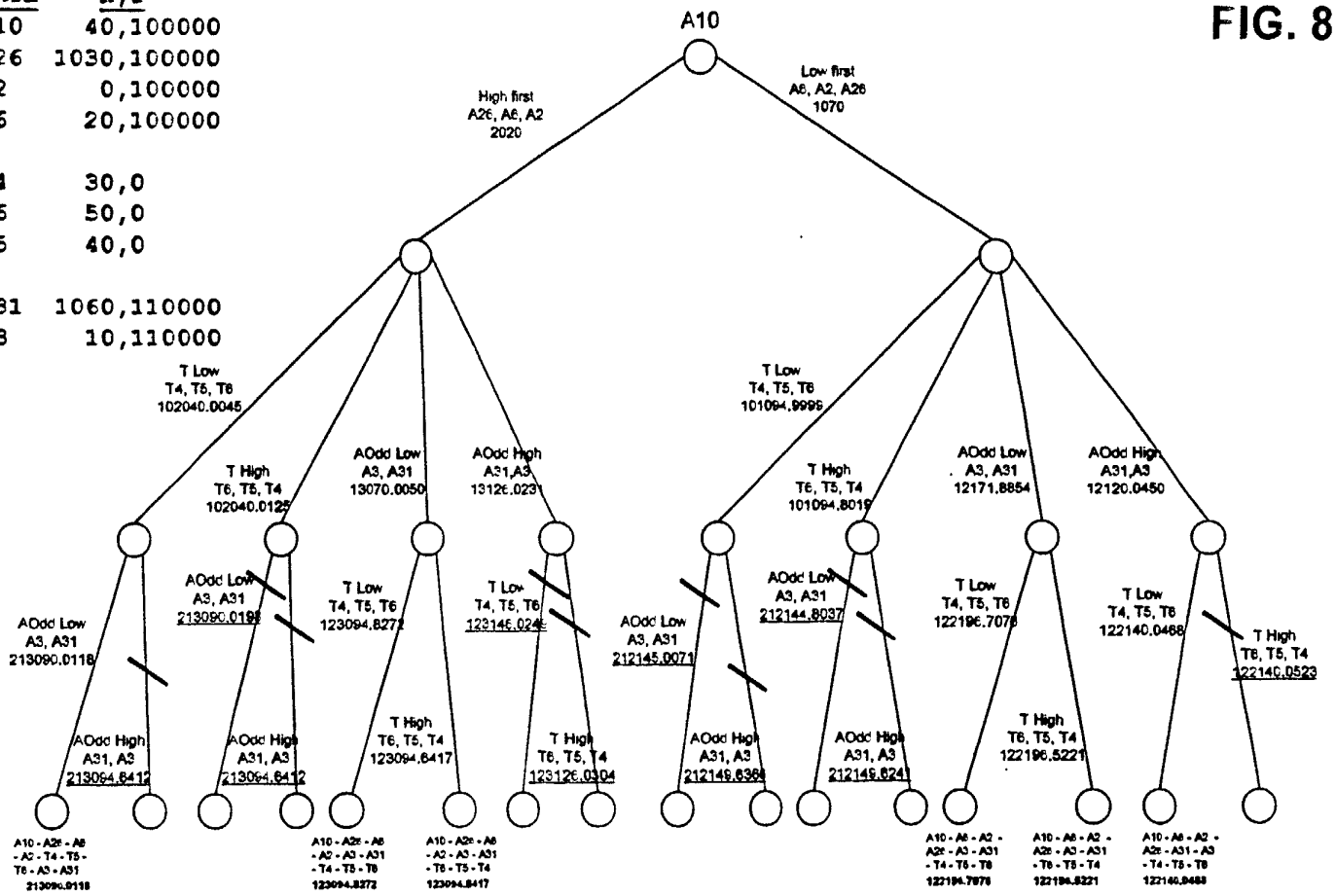

FIG. 8

BAGGAGE DELIVERY

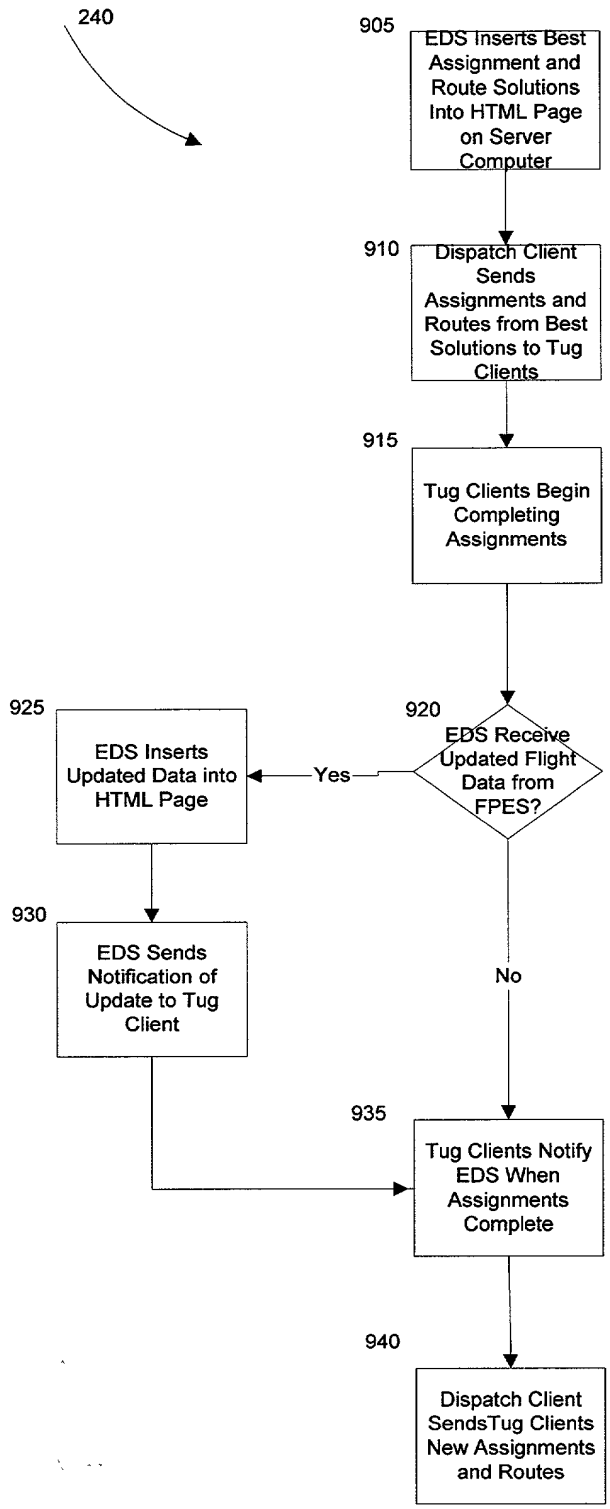

FIG. 9

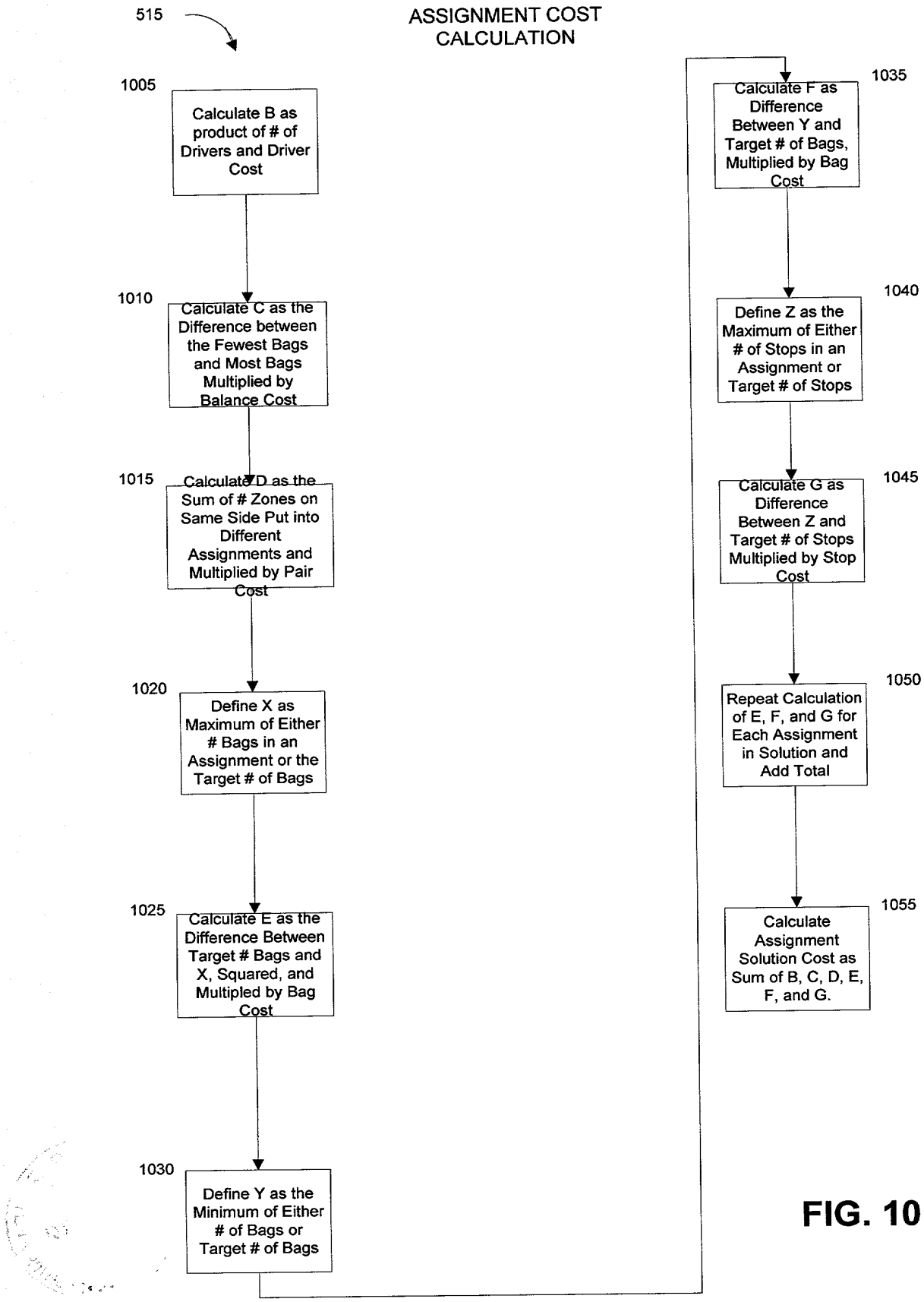
515
ASSIGNMENT COST CALCULATION
1005
Calculate B as product of # of Drivers and Driver Cost
1010
Calculate C as the Difference between the Fewest Bags and Most Bags Multiplied by Balance Cost
1015
Calculate D as the Sum of # Zones on Same Side Put into Different Assignments and Multiplied by Pair Cost
1020
Define X as Maximum of Either # Bags in an Assignment or the Target # of Bags
1025
Calculate E as the Difference Between Target # Bags and X, Squared, and Multipled by Bag Cost
1030
Define Y as the Minimum of Either # of Bags or Target # of Bags
1035
Calculate F as Difference Between Y and Target # of Bags, Multiplied by Bag Cost
1040
Define Z as the Maximum of Either # of Stops in an Assignment or Target # of Stops
1045
Calculate G as Difference Between Z and Target # of Stops Multiplied by Stop Cost
1050
Repeat Calculation of E, F, and G for Each Assignment in Solution and Add Total
1055
Calculate Assignment Solution Cost as Sum of B, C, D, E, F, and G.

FIG. 10